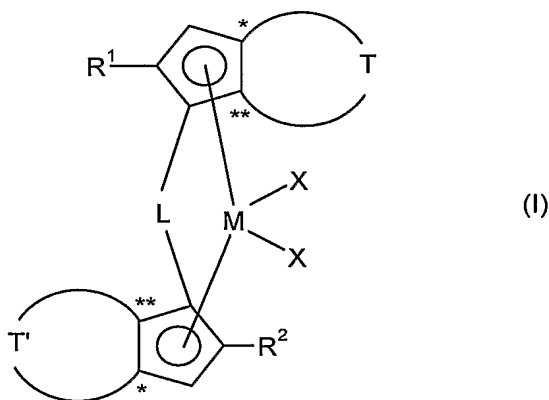


Claims

1. A propylene copolymer composition comprising
 - A) from 50% to 80% by weight of a propylene copolymer containing from 0.05 to 0.99% by weight of an alpha olefins having from 2 to 10 carbon atoms other than propylene; and
 - B) from 20% to 50% by weight of one propylene copolymer containing from about 7.01 to about 20.0 % by weight of an alpha olefins having from 2 to 10 carbon atoms other than propylene;
 said propylene copolymer composition having the following characteristics:
 - (i) MFR (230°C/2,16 kg) comprised between 1 and 20 g/10 min;
 - (ii) tensile E modulus comprised between 400 and 800 MPa (ISO 527-2:1993).
2. The propylene copolymer composition as claimed in claim 1 having a melting point comprised between 143°C and 150°C.
3. The propylene copolymer composition as claimed in claim 1 having haze (ASTM D 1003) comprised between 25% and 40% without the adding of clarifying agents.
4. The propylene copolymer composition as claimed in claim 1, produced using a catalyst system comprising at least one metallocene compound of the formula (I),



where

- M is zirconium, hafnium or titanium,
- X are identical or different and are each, independently of one another, hydrogen or halogen or an -R, -OR, -OSO₂CF₃, -OCOR, -SR, -NR₂ or -PR₂ group, where R is linear or branched C₁-C₂₀-alkyl, C₃-C₂₀-cycloalkyl which may be substituted by one or more C₁-C₁₀-alkyl radicals, C₆-C₂₀-aryl, C₇-C₂₀-alkylaryl or C₇-C₂₀-arylalkyl and may contain one or more

heteroatoms of groups 13-17 of the Periodic Table of the Elements or one or more unsaturated bonds, where the two radicals X may also be joined to one another,

L is a divalent bridging group selected from the group consisting of C₁-C₂₀-alkylidene radicals, C₃-C₂₀-cycloalkylidene radicals, C₆-C₂₀-arylidene radicals, C₇-C₂₀-alkylarylidene radicals and C₇-C₂₀-arylalkylidene radicals, which may contain heteroatoms of groups 13-17 of the Periodic Table of the Elements, or a silylidene group having up to 5 silicon atoms, e.g. -SiMe₂- or -SiPh₂-,

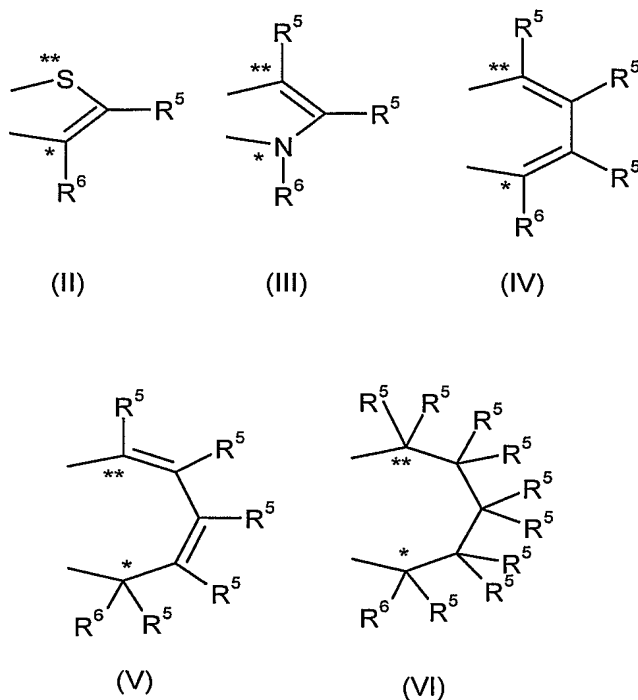
R¹ is linear or branched C₁-C₂₀-alkyl, C₃-C₂₀-cycloalkyl which may be substituted by one or more C₁-C₁₀-alkyl radicals, C₆-C₂₀-aryl, C₇-C₂₀-alkylaryl or C₇-C₂₀-arylalkyl and may contain one or more heteroatoms of groups 13-17 of the Periodic Table of the Elements or one or more unsaturated bonds, where R¹ is preferably a linear or branched C₁-C₁₀-alkyl group which is unbranched in the α position, in particular a linear C₁-C₄-alkyl group such as methyl, ethyl, n-propyl or n-butyl,

R² is a group of the formula -C(R³)₂R⁴, where

R³ are identical or different and are each, independently of one another, linear or branched C₁-C₂₀-alkyl, C₃-C₂₀-cycloalkyl which may be substituted by one or more C₁-C₁₀-alkyl radicals, C₆-C₂₀-aryl, C₇-C₂₀-alkylaryl or C₇-C₂₀-arylalkyl and may contain one or more heteroatoms of groups 13-17 of the Periodic Table of the Elements or one or more unsaturated bonds, or two radicals R³ may be joined to form a saturated or unsaturated C₃-C₂₀-ring,

R⁴ is hydrogen or linear or branched C₁-C₂₀-alkyl, C₃-C₂₀-cycloalkyl which may be substituted by one or more C₁-C₁₀-alkyl radicals, C₆-C₂₀-aryl, C₇-C₂₀-alkylaryl or C₇-C₂₀-arylalkyl and may contain one or more heteroatoms of groups 13-17 of the Periodic Table of the Elements or one or more unsaturated bonds,

T and T' are divalent groups of the formulae (II), (III), (IV), (V) or (VI),



where

the atoms denoted by the symbols * and ** are joined to the atoms of the compound of the formula (I) which are denoted by the same symbol, and

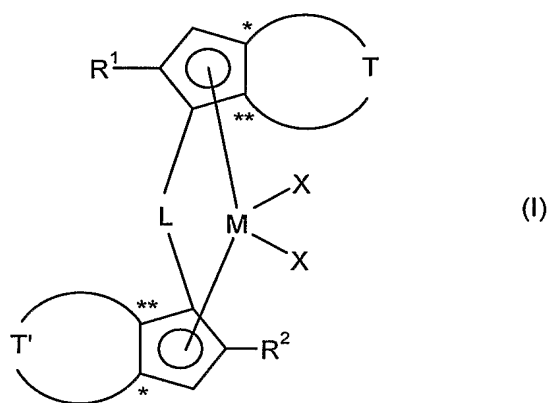
R^5 are identical or different and are each, independently of one another, hydrogen or halogen or linear or branched C_1 - C_{20} -alkyl, C_3 - C_{20} -cycloalkyl which may be substituted by one or more C_1 - C_{10} -alkyl radicals, C_6 - C_{20} -aryl, C_7 - C_{20} -alkylaryl or C_7 - C_{20} -arylalkyl and may contain one or more heteroatoms of groups 13-17 of the Periodic Table of the Elements or one or more unsaturated bonds,

R^6 are identical or different and are each, independently of one another, halogen or a linear or branched C_1 - C_{20} -alkyl, C_3 - C_{20} -cycloalkyl which may be substituted by one or more C_1 - C_{10} -alkyl radicals, C_6 - C_{20} -aryl, C_7 - C_{20} -alkylaryl or C_7 - C_{20} -arylalkyl and may contain one or more heteroatoms of groups 13-17 of the Periodic Table of the Elements or one or more unsaturated bonds.

5. The propylene copolymer composition as claimed in claim 1, wherein the olefin other than propylene is exclusively ethylene.

6. The propylene copolymer composition as claimed in claim 1, wherein a molar mass distribution M_w/M_n is in the range from 1.5 to 3.5.
7. The propylene copolymer composition as claimed in claim 1, wherein the alpha olefin content of component B) is from about 7.01% to about 9.99% by weight.
8. The propylene copolymer composition as claimed in claim 1, wherein the alpha olefin content of component B) is from about 8.0% to about 9.6% by weight.
9. The propylene polymer composition as claimed in claim 1, wherein the MFR is between 6 and 12 g/10min.
10. The propylene polymer composition as claimed in claim 1, wherein the tensile E modulus is between 550 and 750 MPa
11. A process for producing fibers, films or moldings which comprises utilizing the propylene copolymer composition of claim 1.
12. A film produced from a propylene copolymer composition comprising:
 - A) from about 50% to about 80% by weight of a propylene copolymer containing from about 0.05 to about 0.99% by weight of alpha olefins having from 2 to 10 carbon atoms other than propylene; and
 - B) from about 20% to about 50% by weight of a propylene copolymer containing from about 7.01% to about 20.0% by weight of alpha olefins having from 2 to 10 carbon atoms other than propylene;wherein components A) and B) are obtained using a catalyst system based on metallocene compounds, and the propylene copolymer composition has an MFR of from about 1 to about 20 and a tensile E modulus of about 400 to about 800 MPa; and wherein
the film has a haze less than about 10.0% and a dart impact greater than about 150 gms for a 1 mil thickness of film.
13. The film according to claim 12 having a melting point of between about 143°C to about 150°C.
14. The film according to claim 12 where the film has a haze less than about 5% for a 1 mil thickness of film.
15. The film according to claim 12 where the film has a dart impact of greater than about 200 gm for a 1 mil thickness of film
16. The film according to claim 12 where the tensile E modulus of the propylene copolymer composition is from about 550 to about 750 MPa.

17. The film according to claim 12 where the film has a WVTR of greater than about 11.6 gm/m²-day.
18. The film according to claim 12 where the film has a OTR greater than about 3875 gm/m²-day.
19. The film according to claim 12 where the film has a CO₂TR greater than about 19,375 cc/m²-day.
20. The film according to claim 12 where the film has hexane extractables no greater than about 2.6% and xylene solubles less than about 30%.
21. The film according to claim 12 where the metallocene compound is of formula (I):



where

M is zirconium, hafnium or titanium,

X are identical or different and are each, independently of one another, hydrogen or halogen or an -R, -OR, -OSO₂CF₃, -OCOR, -SR, -NR₂ or -PR₂ group, where R is linear or branched C₁-C₂₀-alkyl, C₃-C₂₀-cycloalkyl which may be substituted by one or more C₁-C₁₀-alkyl radicals, C₆-C₂₀-aryl, C₇-C₂₀-alkylaryl or C₇-C₂₀-arylalkyl and may contain one or more heteroatoms of groups 13-17 of the Periodic Table of the Elements or one or more unsaturated bonds, where the two radicals X may also be joined to one another,

L is a divalent bridging group selected from the group consisting of C₁-C₂₀-alkylidene radicals, C₃-C₂₀-cycloalkylidene radicals, C₆-C₂₀-arylidene radicals, C₇-C₂₀-alkylarylidene radicals and C₇-C₂₀-arylalkylidene radicals, which may contain heteroatoms of groups 13-17 of the Periodic Table of the

Elements, or a silylidene group having up to 5 silicon atoms, e.g. $-\text{SiMe}_2-$ or $-\text{SiPh}_2-$,

R^1 is linear or branched $\text{C}_1\text{-C}_{20}$ -alkyl, $\text{C}_3\text{-C}_{20}$ -cycloalkyl which may be substituted by one or more $\text{C}_1\text{-C}_{10}$ -alkyl radicals, $\text{C}_6\text{-C}_{20}$ -aryl, $\text{C}_7\text{-C}_{20}$ -alkylaryl or $\text{C}_7\text{-C}_{20}$ -arylalkyl and may contain one or more heteroatoms of groups 13-17 of the Periodic Table of the Elements or one or more unsaturated bonds,

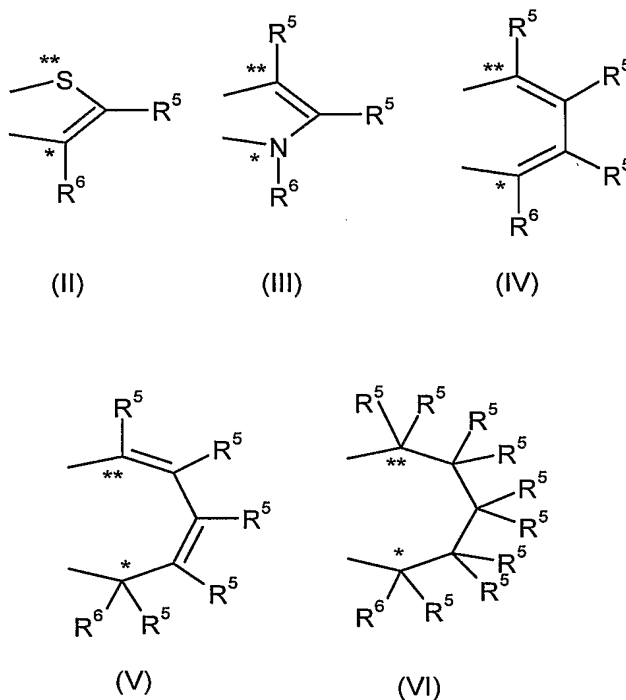
where R^1 is preferably a linear or branched $\text{C}_1\text{-C}_{10}$ -alkyl group which is unbranched in the α position, in particular a linear $\text{C}_1\text{-C}_4$ -alkyl group such as methyl, ethyl, n-propyl or n-butyl,

R^2 is a group of the formula $-\text{C}(\text{R}^3)_2\text{R}^4$, where

R^3 are identical or different and are each, independently of one another, linear or branched $\text{C}_1\text{-C}_{20}$ -alkyl, $\text{C}_3\text{-C}_{20}$ -cycloalkyl which may be substituted by one or more $\text{C}_1\text{-C}_{10}$ -alkyl radicals, $\text{C}_6\text{-C}_{20}$ -aryl, $\text{C}_7\text{-C}_{20}$ -alkylaryl or $\text{C}_7\text{-C}_{20}$ -arylalkyl and may contain one or more heteroatoms of groups 13-17 of the Periodic Table of the Elements or one or more unsaturated bonds, or two radicals R^3 may be joined to form a saturated or unsaturated $\text{C}_3\text{-C}_{20}$ -ring,

R^4 is hydrogen or linear or branched $\text{C}_1\text{-C}_{20}$ -alkyl, $\text{C}_3\text{-C}_{20}$ -cycloalkyl which may be substituted by one or more $\text{C}_1\text{-C}_{10}$ -alkyl radicals, $\text{C}_6\text{-C}_{20}$ -aryl, $\text{C}_7\text{-C}_{20}$ -alkylaryl or $\text{C}_7\text{-C}_{20}$ -arylalkyl and may contain one or more heteroatoms of groups 13-17 of the Periodic Table of the Elements or one or more unsaturated bonds,

T and T' are divalent groups of the formulae (II), (III), (IV), (V) or (VI),



where

the atoms denoted by the symbols * and ** are joined to the atoms of the compound of the formula (I) which are denoted by the same symbol, and

R⁵ are identical or different and are each, independently of one another, hydrogen or halogen or linear or branched C₁-C₂₀-alkyl, C₃-C₂₀-cycloalkyl which may be substituted by one or more C₁-C₁₀-alkyl radicals, C₆-C₂₀-aryl, C₇-C₂₀-alkylaryl or C₇-C₂₀-arylalkyl and may contain one or more heteroatoms of groups 13-17 of the Periodic Table of the Elements or one or more unsaturated bonds,

R⁶ are identical or different and are each, independently of one another, halogen or a linear or branched C₁-C₂₀-alkyl, C₃-C₂₀-cycloalkyl which may be substituted by one or more C₁-C₁₀-alkyl radicals, C₆-C₂₀-aryl, C₇-C₂₀-alkylaryl or C₇-C₂₀-arylalkyl and may contain one or more heteroatoms of groups 13-17 of the Periodic Table of the Elements or one or more unsaturated bonds.

22. The film according to claim 12 where the MFR is from about 6 to about 12.
23. An article comprising at least one layer of a film produced from a propylene copolymer composition comprising:

A) from about 50% to about 80% by weight of a propylene copolymer containing from 0.05 to 0.99% by weight of an alpha olefins having from 2 to 10 carbon atoms other than propylene; and

B) from about 20% to about 50% by weight of a propylene copolymer containing from about 7.01 to about 20.0 % by weight of an alpha olefins having from 2 to 10 carbon atoms other than propylene;

wherein components A) and B) are obtained using a catalyst system based on metallocene compounds, and the propylene copolymer composition has an MFR of from about 1 to about 20 and a tensile E modulus of from about 400 to about 800 MPa; and

wherein the film has a haze less than about 10.0% and a dart impact greater than about 150 gms for a 1 mil thickness of film.

24 A laminate comprising at least one layer of a polyolefin film and at least one layer of a film produced from a propylene copolymer composition comprising:

A) from about 50% to about 80% by weight of a propylene copolymer containing from about 0.05 to about 0.99% by weight of an alpha olefins having from 2 to 10 carbon atoms other than propylene; and

B) from about 20% to about 50% by weight of a propylene copolymer containing from about 7.01 to about 20.0 % by weight of an alpha olefins having from 2 to 10 carbon atoms other than propylene;

wherein components A) and B) are obtained using a catalyst system based on metallocene compounds, and the propylene copolymer composition has an MFR of from about 1 to about 20 and a tensile E modulus of about 400 to about 800 MPa; and wherein

the film has a haze less than about 10.0% and a dart impact greater than about 150 gms for a 1 mil thickness of film.

25. A coated article comprising a substrate and a film produced from a propylene copolymer composition comprising:

A) from about 50% to about 80% by weight of a propylene copolymer containing from about 0.05 to about 0.99% by weight of an alpha olefins having from 2 to 10 carbon atoms other than propylene; and

B) from about 20% to about 50% by weight of a propylene copolymer containing from about 7.01 to about 20.0 % by weight of an alpha olefins having from 2 to 10 carbon atoms other than propylene;

wherein components A) and B) are obtained using a catalyst system based on metallocene compounds, and the propylene copolymer composition has an MFR of from about 1 to about 20 and a tensile E modulus of about 400 to about 800 MPa; and wherein

the film has a haze less than about 10.0% and a dart impact greater than about 150 gms for a 1 mil thickness of film, wherein the film has been coated onto the substrate.

26. A co-extruded multilayer film comprising at least one layer of a film produced from a propylene copolymer composition comprising:

A) from about 50% to about 80% by weight of a propylene copolymer containing from about 0.05 to about 0.99% by weight of an alpha olefins having from 2 to 10 carbon atoms other than propylene; and

B) from about 20% to about 50% by weight of a propylene copolymer containing from about 7.01 to about 20.0% by weight of an alpha olefins having from 2 to 10 carbon atoms other than propylene;

wherein components A) and B) are obtained using a catalyst system based on metallocene compounds, and the propylene copolymer composition has an MFR of from about 1 to about 20 and a tensile E modulus of about 400 to about 800 MPa; and wherein

the film has a haze less than about 10.0% and a dart impact greater than about 150 gms for a 1 mil thickness of film.

27. The process of claim 11 for producing moldings.

28. The process of claim 27 wherein the moldings are large hollow bodies.